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Taking the Long View of Media and Machines.

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Possibilities for greater technologically oriented education are explored. It is theoretically possible, if not economically feasible, to have computer classrooms producing individualized instruction for each child. In connection with technological media it is necessary to keep five ideas in mind. (1) Children today, subjected to many visual and audio experiences, are less print conscious than were children of previous generations. (2) Recent experience with varied instructional technology leads to less confidence that any medium or machine can bear the total instructional load in reading. (3) A trend is developing to design and produce materials through a systems approach, trying to identify the function of each medium and then to relate one to another. (4) Recently emphasis has shifted from attention to media as a teaching device to media as a learning device. (5) The long-range goal, to produce materials which will allow teachers to individualize instruction and to adapt to new methods, is slowly being realized. The problem meanwhile is to utilize what is available to the best purpose in the classroom. (MD)

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TAKING THE LONG VIEW OF MEDIA AND MACHINES

Topic of Session: Evaluation of Materials for Reading

If one is to believe the Sunday supplements about teaching today, we have in many schools the complete technologically-oriented classroom -- taught, planned, controlled, or supported by computers, enriched by video, enlivened by continual and regular use of talking typewriters, dial access systems, microfiche readers, listening posts, multi-screen, photo-assisted instruction, auto-instructional learning carrels, psychedelic multi-media presentations -- all geared to individual learning needs and providing ungraded, individually prescribed instruction so that each child can proceed at his own pace.

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But if one looks instead at the classroom teacher of reading, we find more often than not too many pupils and too few books; hardware without software; independent kits, slides, films, and multi-sensory packages that seem incapable of interrelation; and above all a desperate attempt to provide adequate conditions for learning in the face of increasingly strained school budgets.

Somewhere between the spectre of the future and the reality of today, new media or instructional technology must still find its place. Cost factors alone preclude the possibility that the complete electronic classroom will be with us for yet some time. The Committee on Economic Development, for example, estimates an extra 9 to 24 billion dollars to provide computer-assisted instruction in every classroom, a sum half again as large as our current national outlay for public education. Even the Educational Technology Act, now introduced in the 91st Congress, whose aim is to stimulate more effective use of technology, would require an expenditure of from 313 million dollars to 877 million dollars annually just for the professional education, school staffing, materials and equipment, model centers and media evaluation needed to begin more efficient use. Continued research and experimentation and the genius of American industry will someday make widespread technological installations financially feasible, and perhaps John Pierce's prediction in a recent New York Times will yet come to pass --- children twenty-five years

hence learning to read and spell at home through computer-aided instruction; school hours confined almost entirely to group activities; telephoned or televised lectures available through home dial access coxial cable systems to stimulate the children of tomorrow; computer-accessible information utilities, the libraries of the future designed to make research a source and a habit for every pupil. Indeed George Leonard in Education and Ecstasy envisions a school in the year 2001 to which children can come and go as they wish. Already at one experimental institution, the Couch School in Portland, Oregon, claims that only a third to a half of the children remain enrolled for classroom instruction after 9:30 a.m. Following their own inclination, the others visit libraries, museums, businesses, welfare agencies, and other institutions. Those who remain on the school grounds are engaged almost entirely in individualized learning.

More of these things may happen throughout American education. Indeed most are theoretically possible today. But they are not yet happening except in pilot programs and are not likely to happen during the next few years as we teach help the next generation of youngsters to learn to read. Here and there we can point to exciting pioneer attempts to achieve important learnings in reading through the partial employment of some of these devices, but without denigrating in any way the importance of current controlled studies to see what can be done, it seems to me folly to conceive that many of the schools in

this country are yet ready to embrace the total spectrum of technological innovation currently being spread before us.

Yet no teacher of reading operates in the same educational environment as did teachers years ago. If we are not yet ready or able to embrace the full spectrum of multi-sensory devices, we are at least moving to enhance our programs with some of the more effective and accessible aids. The new Standards for School Media Programs published by the American Association of School Librarians and the Department of Audio-Visual Instruction (NEA) recommends for schools with enrollments of 250 pupils or more a minimum of 20 books per student in a media center but also: 1,500 filmstrips or three per student; 500 8 mm short cartridge films or 1 1/2 per student; 3,000 16 mm films; 3,000 records or tapes, at least 6 per student. However optimistic these standards, they indicate the changing nature of the educational world. Any view, therefore, of the relevance of media and machines in reading instruction today must consider the climate of change and transition in our educational institutions and the ways in which these changes may affect the children that we teach. At least five ideas seem worthy of explication.

1. We know that children today, subjected to visual and audio experiences of many different kinds, tend to organize their "image-fields" quite differently than those reared in earlier "print-oriented" cultures. This is the essential insight to be gleaned from the writings of Marshall McLuhan and Walter Ong.

Both perception of ideas and transmission of ideas are changing rapidly, and the ultimate effect on young people is multiple and not always clear. Our learners come to classrooms today with greater visual awareness, more sensitivity to total impression, and increasing awareness of diverse value systems than any children of the past. In deriving their basic ideas, they are far less prone to rely solely on the impact of parents or teachers or on the impact of reading itself. Perhaps the most basic change has been in the ways in which children evaluate ideas and values, testing them always against the rich variety of aural, oral, visual, reading, and personal experiences that they have had. What this suggests for instruction is the crucial importance of our relying on multi-media approaches in presenting and transmitting ideas, of coming to grips with the fact that the reading of the printed text is only one way, albeit still the most significant and lasting way, of helping young people gain meaning from the world around. More concern with other forms of transmitting ideas -- with both the visual and the audio -- thus seem crucial both in providing balanced instruction in the perception and evaluation of ideas and in appealing to the several senses of the young.

although we must demand today new kinds of visuals even in our printed text

We need, of course, to learn more about visual language and its relationship to verbal language. Particularly we need information on the impact of visual education on children who differ in age, intelligence, and social and cultural background. Visual approaches to conceptual learning may, as some

researchers currently suggest, have special impact on disadvantaged inner city children who are handicapped in linguistic development. Certainly our experience today suggests that however important visual and manipulative aids may be in stimulating learning among children in many kinds of classrooms, they are of unique importance in working with those who lack facility with language.

2. The closer we look at recent experience in using varied instructional technology in education, the less confidence we are likely to have that any particular media or machine can bear the total instructional load in reading. Talking typewriters, television films and video tapes, 2 x 2" slides, language masters, audio flashcards, auto-instructional units, and teaching machines of one kind or another may well play vital roles in many kinds of classroom programs, and depending upon the nature of the students and the capacity of the teacher and/or the creativeness of authors and publishers to integrate such work with other studies, this role may be highly significant. But given the complexity of teaching young people to read, of assisting them not only in relating sound to sense, but in evaluating and interpreting the written text itself, any one of these devices or approaches seems to work most effectively when carefully integrated with other approaches to learning.

The experience with instructional television is a case in point. Hagerstown's television worked best when the system itself worked best. Language

laboratories worked best in teaching foreign languages when incorporated into a total teaching program, not when isolated from teacher-pupil interaction. It is no condemnation of computer-assisted instruction or of any other approach to suggest that we need to discover those things each can do best and those they do less well, then work toward developing manageable programs which permit us to obtain full value from the unique capacity of each.

3. A clear trend is already developing to conceive, plan, develop, and produce materials, including materials in the new media, through a systems approach, attempting to identify the unique function of each media within the overall program and then to relate each item to one another.

Already those who are engaged in the development of comprehensive reading programs are concerned about unmanageable total programs. In any sound reading system, we know enough to provide some materials for common class or large group experiences, some materials for small groups, and some for individual learning. Conceptions of what may be needed and appropriate for, say, individualized reading and practice may differ, depending upon an individual school or teacher's class organization. It will differ also with the availability of equipment. Increasingly, new simplified machines make possible individual and small group uses of learning devices once confined merely to teacher presentation; filmstrips, for example, projection transparencies, or 8 mm cartridge films. Some approaches, particularly the programmed or

computerized drills, seem destined to make possible the particular kinds of continuous individual learning, but do so by sacrificing important classroom interaction. In such programs, clearly, provision must be made for teacher and pupil interaction in other ways. Clearly, one of the major problems yet to be solved is that of utilizing the potential of the machine without imposing it as a barrier between the learner and his material and his teacher.

My point is not to suggest the superiority of one approach over another but to suggest that many different approaches with a variety of stimuli, each related intelligently one to another, will form the basis of more sophisticated learning systems of the future. Yet even before we can consider making available the fully integrated programs of which I speak, changes in school purchasing practice are needed toassure intelligent use. Recent experience has indicated that books and printed material are frequently administered under one instructional budget; new media and machines under another. The former may be the province of the curriculum supervisor; the latter, of the audio-visual specialist. Authors, producers, and publishers, caught in such a squeeze under which no fully integrated reading program can ever be evaluated in its totality, much less purchased as a system, are not likely to venture forth with completely integrated multi-sensory systems until assured that programs of this kind can and will be evaluated in terms of their total merit.

At the present time, moreover, twenty-two states rely on adoption procedures which militate against the selection of complete learning systems;

i.e., procedures under which only the basic books are selected and adjunctive materials associated with any system must be purchased by individual districts. As long as such policies are widespread, we cannot anticipate widespread introduction of complete systems for teaching reading.

4. During the last few years we have seen an important shift in attention from the carrier of educational media to the content, from the hardware to the software, from how to achieve programs of quality to concern with the impact of media on the learner. As Robert Gagni points out, the changes in instructional procedures are likely to be greater than the changes in the hardware itself. What we have seen, in short, has been a revival of concern with media's contribution to the process of learning, rather than with media as instruments of teaching. We are concerned with how to apply instructional technology to the learning styles of different children to the varied ways of relating to each student, to the sequence of skills being taught. We are concerned less with media as a product -- to be used variously by individual teachers as an aid -- than with media (hardware or software) as playing an instrumental role in the process of education. Thus we find less and less use of media to present direct and expository material, more and more use of imaginative visuals to stimulate creative thinking, to awaken children's questions.

Even the printed readers change in this direction as they adjust to the new visual sensitivities of our children. There are those who predict the demise of textbooks as they look forward to the millennium in education, but death we are less likely to see than regeneration and transformation. In the traditional sense, the textbook as it has been used is little more than a prescribed procedure for accomplishing certain instructional goals. With the introduction of new media and renewed concern for facilitating the process of education, we may modify what we ask of print as we ask more of newer machines and media. But we are not likely to abandon program purpose for uncoordinated, unclassified, and miscellaneous instructional material. In short, in some form the prescribed program, capable of modification in any classroom, will remain with us permanently in education.

5. The long range goal in using the new media is to provide, with maximum assistance to the classroom teacher, ways of individualizing instruction and of adapting to new patterns of educational innovation like continuous pupil progress, non-grading, and flexible scheduling.

Already many of our books are non-graded and increasingly multi-level as well. Multiple book packages are replacing the traditional single texts. Classroom kits and supplementary programs are introduced each year in forms sufficiently flexible to be used in a variety of situations. In one Colorado school district where pupils are transported over long distances,

buses are being equipped with individual listening posts so that taped practice in word recognition can fill transportation time. Increasingly, materials and devices become available for independent pupil use, freeing the teacher to care for other learning. We can look forward now to the reality of dial access systems which someday may help the classroom teacher recapture on call from some central resource virtually all visual media on a classroom television screen. Ultimately, computer-managed instruction may support much of our classroom work, helping teachers to manage written tasks, oral exercises, ~~and~~ vocabulary programs, ~~as well as~~ and other programs, as well as manage the mechanistic practice so highly publicized today. These are hopes and visions, of course. Not only must they await determination of financial feasibility, but, more importantly, the development of sophisticated computers capable of decoding human speech and writing. Such development, I understand, is at least a full ten years away.

Yet in the meantime we must admit that new media are seldom used as effectively in teaching reading as they can be. We need, thus, to think less of what such media claims to do and more about what it might do if used wisely and well. Not all devices will prove useful for all purposes but some will prove exceptionally useful for some purposes. The cost, we know, can accelerate quickly, but so can the potential benefits. A sound, balanced approach in instructional planning will call for careful testing and experimentation of the potentiality of both media and machines before there can be widespread adoption and purchase of any systems.

We must strike a balance between those whom Wilbur Schram calls the pied pipers of education -- leading us always to visionary dreams of our technologically-oriented future -- and the educational hippopotami who resist all needed change. In assessing the contributions of both media and machines we must steer between the Scylla of missionary invocation and the Charbydis of conservative rejection. Hopefully, some of the ideas sketched in this paper may assist in chartering a course.